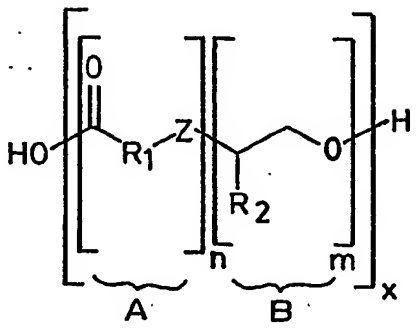
CLAIMS

1. A functionalizable polymer of the formula I :



(I)

wherein:

Z is -O- or -NH-;

R_1 represents a non-functional backbone of a hydroxy acid or amino acid derived from a cyclic ester or diester or cyclic amide or diamide monomer (A);

R_2 represents a non-functional chain derived from an epoxide monomer (B), said chain ending with a graftable hydroxy or carboxylic group;

n is the number of units derived from the monomers (A);

m is the number of units derived from the monomers (B); and

x is equal to n+m;

the ratio m/x ranging from 0.005 to 0.30.

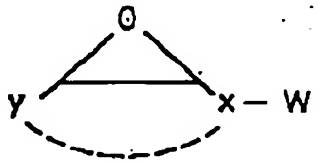
2. The functionalizable polymer of formula I as claimed in claim 1, wherein R1, R2, n, m and x are selected so that the average molecular weight of the polymer ranges from 1,000 to 50,000.

3. The functionalizable polymer of formula I as claimed in claim 1 or 2, wherein Z is -O- and the monomer A is selected from the group consisting of lactones, dioxanones and dioxanediones.

4. The functionalizable polymer of formula I as claimed in claim 3, wherein the monomer A is selected from the group consisting of caprolactone, glycolide, dilactide and glycolic lactide.

5. The functionalizable polymer of formula I as claimed in claim 1 or 2, wherein Z is -NH- and the monomer A is selected from the group consisting of lactams and dilactams.

6. The functionalizable polymer of formula I as claimed in any one of claims 1 to 5, wherein the monomer B is selected from the group consisting of the epoxides of formula II:



(II)

wherein:

X is a non-functional chain optionally containing one or more heteroatoms but no ester or amide link;

W is $-CH_2CH_2OH$ or $-CH_2COOH$; and

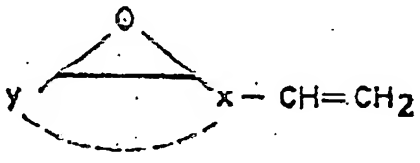
Y is H, alkyl or phenyl;

X and Y being optionally linked to each other as shown in dotted lines.

7. The functionalizable polymer of formula I as claimed in any one of claims 1 to 5, wherein the monomer B consists of alkyl glycidyl ether.

8. A process for preparing a functionalizable polymer of formula I as defined in any one of claims 1 to 7, comprising the steps of:

a) reacting at least one monomer A as defined in claim 1, 3 or 4 with at least one epoxide of formula III



(III)

wherein X and Y are defined as in claim 6, in the presence of a catalyst;

b) subjecting the polymer obtained in step a) to an oxidation to convert the $-CH=CH_2$ groups into corresponding $-CH_2CH_2OH$ groups; and

c) optionally subjecting the polymer obtained in step b) to another oxidation with a Jones mixture to convert the $-CH_2CH_2OH$ groups into corresponding $-CH_2COOH$ groups.

9. The process of claim 8, wherein:

step a) is carried out with a tin catalyst at a temperature higher than 100°C under inert atmosphere.

10. The process of claim 8 or 9, wherein:

step b) is carried out under mild oxidation conditions.

11. The process of claim 10, wherein:

step b) is carried out by hydroboration at low temperature.

12. The process of any one of claims 8 to 11, wherein the polymer obtained after each of the steps a) to c) are recovered and purified prior to being subjected to the next step.

13. A functionalized polymer consisting of a functionalizable polymer of the formula I as claimed in any one of claims 1 to 7, or prepared by the process as claimed in any one of claims 8 to 12, to the graftable hydroxy or carboxylic groups of which has been grafted a compound selected from the group consisting of:

ligands specific to cellular receptors;

lipids;

peptides;

polyethers;

polyacrylates;

natural polymers;
polyosides;
antigens or antibodies;
salen; and
cyclodextrins.

14. The functionalized polymer of claim 13, wherein the compound grafted to the polymer of formula II is a biomedically or pharmaceutically active substance.

15. The functionalized polymer of claim 14, wherein the compounds grafted to the polymer of formula I is a ligand specific to Selectine E.

16. The functionalized polymer of claim 13 or 14, which is in the form of nanospheres to facilitate delivery of the active substance.